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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/717,567	11/21/2000	Paul A. Kohl	BFGBP0217US	2128

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EXAMINER	
MITCHELL, JAMES M	

ART UNIT	PAPER NUMBER
2813	

DATE MAILED: 09/22/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/717,567	KOHL ET AL.	
	Examiner	Art Unit	
	James M. Mitchell	2813	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *05 July 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *59-74* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *59-74* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. This office action is in response to applicant's amendment filed July 5, 2005.

Allowable Subject Matter

2. The indicated objection of claim 67 is withdrawn in view of the newly discovered reference(s) to Masaaki (JP 62-005643). Rejections based on the newly cited reference(s) follow.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 59-65, 67 and 72-73 are rejected under 35 U.S.C. 102(b) as being anticipate by Masaaki (JP 62-005643).

5. Masaaki (Fig.1) discloses:

(cl. 59, 61, 67, 74) a semiconductor device comprising: a substrate (1); a patterned layer (3-5) includes a regions (i.e. left and to the right of gap) thereof bordered by air gaps (7); and an overcoat layer (2) overlying the patterned layer of conductive material and the air gap, the overcoat layer having a portion thereof overlying the conductive material in the region bordered by the air gaps, and said portion extending below the height (i.e. top of gap) of the adjacent air gaps, and the air gaps are of a uniform width

over the height thereof (i.e. interpreted to mean the width in the uppermost region of gap is uniform; see Fig. 1);

(cl. 60) and the conductive material forms leads/wiring of a semiconductor device (English Title);

(cl. 62-64) wherein the overcoat is a dielectric/non-conducting, silicon dioxide material (Eng. Abstract);

(cl. 63) and a surface (i.e. portion defining gap) of the conductive material adjacent air gap is covered by a film of non-conducting material;

(cont. cl. 67) and the air gaps extend below the conductive material (i.e. below wiring; Fig. 1);

6. With respect to the intended use limitation of claim 65 that "...the non-conducting material controls corrosion," the prior art form s the same structure as claimed. As such, the intended use limitation does not impart patentability, since it has been held that the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus satisfying the claimed structural limitations. *Ex parte Masham*, 2 USPQ2d 1647 (1987).

7. With respect to claims 72 and 73, although Avanzino has the same structure as that claimed, Avanzino does not appear to explicitly disclose the process limitation "such as" the conductive layers being patterned and the semiconductor device formed by removing a sacrificial material from a pre-cursor made in accordance with a "method comprising the steps of: (A) forming a patterned layer of the sacrificial material on a substrate corresponding to a pattern of air gaps to be formed in the semiconductor

structure..." "[E]ven though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process." In re Thorpe, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985).

8. Claim 68-70 are rejected under 35 U.S.C. 102(b) as being anticipated by Avanzino (U.S 5,776,834).

9. Avanzino (Fig 16) discloses a semiconductor device comprising: a substrate (11,15); a patterned layer (12) of conductive material disposed on the substrate and having a region thereof bordered by air gaps (i.e. not labeled); and an overcoat layer (20) overlying the patterned layer of conductive material and the air gap, the overcoat layer having a portion thereof overlying the conductive material in the region bordered by the air gaps; and wherein a surface of the conductive material adjacent a respective air gap is covered by a discrete film (26) of [also cl. 69, 70] silicon dioxide, non-conducting material (Col. 7, Lines 6-8) that does not extend over the conductive material beyond (i.e. interpreted to mean that film extend to a greater distance/height than gap) the air gap that controls corrosion of the surface of the conductive material covered by the film, wherein the film controls corrosion, see paragraph 6.

Claim Rejections - 35 USC § 103

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

11. Claims 66 and 74 are rejected under 35 U.S.C. 103(a) as being unpatentable over Masaaki (JP62-005643).

12. Masaaki discloses the elements stated in paragraphs 5-7 of this office action and further a thickness of the film (i.e. three dimensional) and the substrate having a planar extent (i.e. top surface of substrate, 11 is planar), but does not appear to explicitly disclose that the non-conducting material has a thickness of about 100 â or that upper sides of the gap are parallel to the planar extent.

13. Since applicant has not disclosed that its dimensions are for a particular unobvious purpose, produce an unexpected result, or are otherwise critical , it would have been obvious to form the film at the claimed thickness or gap with the claimed shape, since it has been held that mere dimensional limitations are prima facie obvious absent a disclosure that the limitations are for a particular unobvious purpose, produce an unexpected result, or are otherwise critical. See, for example, In re Rose, 220 F.2d 459, 105 USPQ 237 (CCPA 1955); In re Rinehart, 531 F.2d 1048, 189 USPQ 143 (CCPA 1976); Gardner v. TEC Systems, Inc., 725 F.2d 1338, 220 USPQ 777 (Fed. Cir. 1984), cert. denied, 469 U.S. 830, 225 USPQ 232 (1984); In re Dailey, 357 F.2d 669, 149 USPQ 47 (CCPA 1966).

14. Claims 71 and 74 are rejected under 35 U.S.C. 103(a) as being unpatentable over Avanzino (U.S 5,776,834).

15. Avanzino discloses the elements stated in paragraph 9 of this office action and further a thickness of the film (i.e. three dimensional) and the substrate having a planar extent (i.e. top surface of substrate, 11 is planar), but does not appear to explicitly disclose that the non-conducting material has a thickness of about 100 â or that upper sides of the gap are parallel to the planar extent.

16. With respect to the claimed size and shape, see paragraph 13 of this office action.

17. Claims 68-71 are rejected under 35 U.S.C. 103(a) as being unpatentable over Masaaki[1] (JP62-005643) in combination with Avanzino (U.S. 5,776,834).

18. Masaaki discloses the elements stated in paragraphs 5-7 of this office action, but does not appear to show a discrete film of non-conducting material that does not extend over the conductive material and beyond the air gap (i.e. interpreted to mean that film extend to a greater distance/height than gap).

19. Avanzino utilizes (as indicated *supra*) a discrete film (26) of silicon dioxide, non-conducting material that does not extend over the conductive material beyond the air gap (Fig. 16).

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[1] Likewise the previous cited art, Machida (JP63-098134) could have been alternatively used as the primary reference for claims 68-71.

20. It would have been obvious to one of ordinary skill in the art to incorporate a discrete film in the manner taught by Avanzino in order to eliminate hillocks as taught by Avanzino (Col. 7, Lines 4-6).

21. With respect to the claimed thickness of claim 71, see paragraph 13.

Response to Arguments

22. Applicant's arguments with respect to claims 59-66 have been considered but are moot in view of the new ground(s) of rejection.

23. With respect to claim 68 applicant contends that the claimed invention is patentable over Avanzino, because allegedly the prior art shows that its discrete film extends over the conductive line and beyond the air gap in contrast to the claimed invention; applicant highlighting a film on the sides of the conductive material allegedly supports this. Examiner disagrees. Because the prior art is within the scope of the plain and ordinary meaning of the claims, examiner is un-persuaded as to patentability. Furthermore, a film extending along side of the conductive material (i.e. vertical portion extend under the gap) is not mutually exclusive from not extending beyond the gap as indicated, *supra*.

Conclusion

24. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The prior art shows the use of gaps with a height above adjacent wiring/conductive material.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to James M. Mitchell whose telephone number is (571) 272-1931. The examiner can normally be reached on M-F 8:00-4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carl Whitehead Jr. can be reached on (571) 272-1702. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Jmm
September 15, 2005

LAURA M. SCHILLINGER
PRIMARY EXAMINER